

Patent Claims

1. A Schottky diode having a semiconductor body (1,
5 2) of a first conductance type, having a Schottky
contact (6) which is provided on the semiconductor body
(1, 2), and having two or more regions (4, 5) of the
other conductance type, which are located in the
semiconductor body (1, 2) underneath the Schottky
10 contact (6) and are at least partially adjacent to the
Schottky contact (6),
wherein,
in order to initiate the injection of a starting
current, at least one (5) of the regions (4, 5) of the
15 other conductance type is designed such that the
minimum distance (D) between the center of the at least
one region (5) and an area of the first conductance
type is considerably greater than the corresponding
minimum distance (d) between the other regions (4) of
20 the other conductance type.
2. The Schottky diode as claimed in claim 1,
wherein
the at least one region (5) of the other conductance
25 type has a larger area than the respective areas of the
other regions (4) of the other conductance type.
3. The Schottky diode as claimed in claim 1 or 2,
wherein
30 the regions (4, 5) of the other conductance type are at
least partially cohesive.
4. The Schottky diode as claimed in one of claims 1
to 3,
35 wherein

the regions (4, 5) of the other conductance type are at least partially in the form of strips, and at least two regions which are in the form of strips are connected to one another via at least one further region (5) of the other conductance type.

5. The Schottky diode as claimed in claim 4, wherein the further region (5) of the other conductance type is rectangular, square, round or oval.

6. The Schottky diode as claimed in one of claims 1 to 5, wherein an annular region (4, 4') of the other conductance type is provided at the edge of the Schottky contact (6).

7. The Schottky diode as claimed in one of claims 1 to 5, wherein the further region (5) of the other conductance type is provided at the edge of the Schottky contact (6).

8. The Schottky diode as claimed in claim 7, wherein the further region (5) of the other conductance type has a sawtooth shape.

9. The Schottky diode as claimed in claim 7 or 8, wherein the regions (4) of the other conductance type are incorporated in the area which is surrounded by the further region (5) of the other conductance type.

10. The Schottky diode as claimed in claim 9, wherein

the regions (4) of the other conductance type are rectangular, square or round.

11. The Schottky diode as claimed in claim 1 or 2, wherein

5 the regions of the other conductance type (4, 5) are square or rectangular, and at least one of these regions has a larger area than the other regions.

12. The Schottky diode as claimed in claim 4,
10 wherein
the regions (4) of the other conductance type which are in the form of strips originate like combs from the further region (5) of the other conductance type.

15 13. The Schottky diode as claimed in one of claims 1 to 12,
wherein
the Schottky contact (6', 6'') is interrupted.

20 14. The Schottky diode as claimed in one of claims 1 to 13,
wherein
the Schottky contact is composed of titanium.

25 15. The Schottky diode as claimed in one of claims 1 to 14,
wherein
an opposing electrode (9) is composed of nickel.

30 16. The Schottky diode as claimed in one of claims 1 to 15,
wherein
the first conductance type is the n-conductance type.

35 17. The Schottky diode as claimed in one of claims 1 to 16,

wherein

the semiconductor body (1, 2) is composed of silicon or silicon carbide.

5 18. A Schottky diode having a semiconductor body (1, 2) of a first conductance type, having a Schottky contact (6) which is provided on the semiconductor body (1, 2), and having two or more regions (4, 5) of the other conductance type, which are located in the
10 semiconductor body (1, 2) underneath the Schottky contact (6) and are at least partially adjacent to the Schottky contact (6), in which the minimum distance (D) between the center of the at least one region (5) and an area of the first conductance type is considerably
15 greater than the corresponding minimum distance (d) between the other regions (4) of the other conductance type,

wherein

the minimum distance is chosen such that the at least
20 one region acts as a starting area, and results in the injection of a starting current.

19. The Schottky diode as claimed in claim 1,
wherein

25 the center of the at least one region (5) is not exclusively located in the transitional area between an active area of the Schottky diode and its edge area.

20. A Schottky diode having a semiconductor body (1, 2) of a first conductance type, having a Schottky
30 contact (6) which is provided on the semiconductor body (1, 2), and having two or more regions (4, 5) of the other conductance type, which are located in the semiconductor body (1, 2) underneath the Schottky
35 contact (6) and are at least partially adjacent to the Schottky contact (6),

wherein,

in order to initiate the injection of a starting current, at least one (5) of the regions (4, 5) of the other conductance type is designed such that the
5 minimum distance (D) between the center of the at least one region (5) and an area of the first conductance type is considerably greater than the corresponding minimum distance (d) between the other regions (4) of the other conductance type, and

10 wherein

the center of the at least one region (5) is not exclusively located in the transitional area between an active area of the Schottky diode and its edge area.